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| 10/605,034 | 09/03/2003 | SU TAO | 10231-US-PA | 2033 |

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JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE
7 FLOOR-1, NO. 100
ROOSEVELT ROAD, SECTION 2
TAIPEI, 100
TAIWAN

EXAMINER

HA, NATHAN W

ART UNIT PAPER NUMBER

2814

DATE MAILED: 03/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/605,034

Applicant(s)

TAO ET AL.

Examiner

Nathan W. Ha

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-9,11-16,18 and 19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-9,11-16,18 and 19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

The finality of the final office action, paper 3/8/05, is withdrawn due to newly discovered references to Sugahara and Pierson. The newly rejections based on the new references follow.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 3 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear which one is the inner surface of the stiffener. The Applicants appear to claim the embodiment in fig. 5. This embodiment does not show that the inner surface faces the chips as claimed in claims 3 and 11.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 3-9, 11-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugahara (US 6,037,656, newly cited,) and in view of Pierson (US 6,569,710, newly cited.)

In regard to claims 1 and 9, 15, in figs. 2-4, Sugahara discloses a chip package structure process, comprising:

providing a substrate 11a;

disposing a chip 10 (semiconductor chip, die) on the substrate and the chip is electrically connected to the matrix substrate through wires 12, for example;

disposing a stiffener 11k on the substrate, wherein the stiffener includes an outer surface and an opposite inner surface and the inner surface of the stiffener faces the matrix substrate, and wherein the stiffener has an openings 11m, fig. 3, and the chip is completely exposed by the opening of the stiffener;

providing a molding compound 11o to cover the chip, the matrix substrate, the outer surface and the inner surface of the stiffener, fig. 2.

Sugahara, however, does not expressly disclose that the chips are formed on the substrate as in more than one and the packages are formed at the same time, then singulate the whole substrate into individual chips. Thus, it should be noted that, the method of forming a plurality of the chip on a same substrate, or wafer, is commonly use, and most cases they must from this way since substrate can be wafers, which formed as a whole piece. This way it is so much more convenient and cost effective. For instance, Pierson, in figs. 1-11, discloses an analogous device which includes a matrix substrate 24, plurality of the chips 38 disposed on the matrix substrate, a stiffener

including plurality of chip openings 32, molding compound, and the substrate is dicing in order to singulate the substrate into several chips, fig. 12.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to recognize the common process as taught by Pierson in Sugahara's in order to take the advantage as mentioned above.

In regard to claims 3 and 11, 16, and in accordance with the 112 rejection above, the inner surface of the stiffener faces the chip, see Sugahara's fig. 3.

In regard to claim 4, the combination further discloses that the stiffener is attached to the substrate through and adhesive 11n, or 20, in Sugahara's fig. 3 and Peirson's fig. 1, respectively.

In regard to claims 5-6, the above combination further discloses a plurality of solder balls 11j, 64 formed on the substrate before/after dicing, see Pierson's figs. 7-11, and Sugahara's fig. 3.

In regard to claims 7 and 12, 18, the wires are used to connect the chip to the substrate. See Sugahara's fig. 2 and col. 4, lines 29-30.

In regard to claim 14, Pierson further discloses that the substrate thickness is .5 microns. See col. 5, lines 18-20.

In regard to claims 8, 13, and 19, the above combination discloses that the stiffener is made of metal, but does not exactly discloses that the stiffener is made of copper. However, Pierson teaches that copper is used in the cover plate, which is attached or connected to the stiffener in order to provide good conduction of heat away from the chip. See Pierson's col. 7, lines 5-10.

Therefore, it would be obvious to one of skill in the art at the time of the invention was made to realize the common use of copper and that can be substitute with the metal stiffener in order to take the advantage as mentioned.

Response to Arguments

5. Applicant's arguments with respect to the above claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan W. Ha whose telephone number is (571) 272-1707. The examiner can normally be reached on M-TH 8:00-7:00(EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wael Fahmy
SPE 2814

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Nathan Ha
February 23, 2006